

Application Serial No.: 09/842,003
Reply to Office Action dated June 23, 2003

IN THE CLAIMS

Please amend the claims as follows:

1. (Canceled)
2. (Currently Amended) A porous preform vitrification apparatus ~~as set forth in claim 1,~~ further comprising:
 - a furnace core tube accommodating a porous preform;
 - a heating furnace surrounding the furnace core tube and heating the furnace core tube;
 - a first gas feeding means for feeding a first gas essentially consisting of helium to the furnace core tube;
 - a first gas feed rate controlling means for controlling a feed rate of the first gas;
 - a first gas discharging means including a gas discharge pipe connected to the furnace core tube and an exhaust suction pump connected to the gas discharge pipe;
 - a first gas discharge rate controlling means for controlling a discharge rate of the gas discharged by the first gas discharging means;
 - a gas feed branch pipe connected to the gas discharge pipe between the first gas discharge rate controlling means and the exhaust suction pump;
 - a second gas feeding means connected to the gas feed branch pipe for feeding a second gas, which comprises nitrogen or air, to the gas discharge pipe; and
 - a drain conduit connected to the gas feed branch pipe connected to the second gas feeding means .
3. (Currently Amended) A porous preform vitrification apparatus ~~as set forth in claim 1,~~ further comprising:
 - a furnace core tube accommodating a porous preform;

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a heating furnace surrounding the furnace core tube and heating the furnace core tube;

a first gas feeding means for feeding a first gas essentially consisting of helium to the furnace core tube;

a first gas feed rate controlling means for controlling a feed rate of the first gas;

a first gas discharging means including a gas discharge pipe connected to the furnace core tube and an exhaust suction pump connected to the gas discharge pipe;

a first gas discharge rate controlling means for controlling a discharge rate of the gas discharged by the first gas discharging means;

a gas feed branch pipe connected to the gas discharge pipe between the first gas discharge rate controlling means and the exhaust suction pump;

a second gas feeding means connected to the gas feed branch pipe for feeding a second gas, which comprises nitrogen or air, to the gas discharge pipe; and

a mechanism for detecting a pressure difference between a pressure in the furnace core tube and a pressure in a heating furnace body provided at an outer circumference of the furnace core tube, and for comprehensively controlling:

a feed rate of the first gas to the furnace core tube,
a discharge rate of an exhaust gas from the furnace core tube,
a feed rate of an inert gas into the heating furnace body,
a discharge rate of the gas from the interior of the heating furnace body,
a feed rate of the second gas fed to the gas feed branch pipe, and
a gas discharge rate of the discharge gas at the exhaust suction pump based on the detected differential pressure signal with the pressure in the furnace core tube as a reference.

4. (Previously Presented) A porous preform vitrification apparatus as set forth in

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claim 3, wherein the feed rate of the second gas fed from the gas feed branch pipe is controlled to 15 to 50% of the rate of the treatment gas essentially consisting of helium fed to the furnace core tube.

5. (Currently Amended) A group of porous preform vitrification apparatuses comprised of a plurality of porous preform vitrification apparatuses as set forth in claim 1 ~~or~~ 2 arranged in parallel, wherein:

the exhaust suction pump is provided for every porous preform vitrification apparatus, and

a common exhaust gas treatment device is provided on the discharge side of the exhaust suction pumps.

6. (Previously Presented) A porous preform vitrification apparatus comprising:
a furnace core tube accommodating a porous preform, a heating furnace surrounding the furnace core tube and heating the furnace core tube, a first means for feeding a gas essentially consisting of helium to the furnace core tube, a feed rate controlling means, a discharging means, and a discharge rate controlling means,

wherein a gas feed branch pipe is connected to a section of a gas discharge pipe connecting the furnace core tube and an exhaust suction pump and in that nitrogen or air is fed from a second gas feeding means provided at the front end of the gas feed branch pipe, and

wherein a drain conduit is connected to the gas feed branch pipe connected to the second gas feeding means.

7. (Previously Presented) A porous preform vitrification apparatus as set forth in claim 6, further comprising a mechanism for detecting a pressure difference between a

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pressure in a furnace core tube and a pressure in a heating furnace body, and
comprehensively controlling:

- a feed rate of the gas to the furnace core tube,
- a discharge rate of an exhaust from the furnace core tube,
- a feed rate of an inert gas into the heating furnace body,
- a discharge rate of the gas from the interior of the heating furnace body,
- a feed rate of a gas such as nitrogen fed to the gas feed branch pipe, and
- a gas discharge rate of the exhaust suction pump based on a differential pressure signal with the pressure in the furnace core tube as a reference.

8. (Previously Presented) A porous preform vitrification apparatus as set forth in claim 7, wherein the feed rate of the nitrogen or air fed from a nitrogen or other gas feed branch pipe is controlled to 15 to 50% of the rate of the treatment gas essentially consisting of helium fed to the furnace core tube.

9. (Previously Presented) A group of porous preform vitrification apparatuses comprised of a plurality of porous preform vitrification apparatuses as set forth in claim 6 arranged in parallel, wherein:

- an exhaust suction pump is provided for every porous preform vitrification apparatus,
- and

- a common exhaust gas treatment device is provided on the discharge side of the exhaust suction pumps.